

## WHAT IS CLAIMED IS:

1. A method for lowering the concentration of hexa-valent chromium in a liquid sample comprising:

contacting a ferrous-form zeolite with a liquid sample having a first level of hexa-valent chromium to remove all or part of said hexa-valent chromium, wherein the liquid sample has a second level of hexa-valent chromium after discharge from the ferrous-form zeolite.

2. The method of claim 1 wherein said contacting is under non-oxidizing conditions.

3. The method of claim 1 further comprising pre-treating said liquid sample prior to contact with the ferrous-form zeolite to reduce the level of oxygen in the sample.

4. The method of claim 1 wherein the ferrous-form zeolite is generated having at least 1 meq ferrous ion per gram of zeolite.

5. An adsorption column for the removal of  $\text{Cr}^{+6}$  from an aqueous medium, the adsorption column comprising:

ferrous-form zeolite for adsorbing  $\text{Cr}^{+6}$  from an aqueous medium; and

a housing for retaining the ferrous-form zeolite;

wherein the aqueous medium is contacted with the ferrous-form zeolite to adsorb the  $\text{Cr}^{+6}$  in the aqueous medium with the ferrous-form zeolite.

6. The adsorption column of claim 5 wherein the zeolite is ferrous-form zeolite comprises at least 0.5 meq ferrous ion per gram of zeolite.

7. The adsorption column of claim 5 wherein the housing is an open-ended column for continuous flow chromatography.

8. The adsorption column of claim 5 further comprising a blanket of inert gas constrained within the housing that covers the ferrous-form zeolite.

9. A system for removing chromium from a target medium, the system comprising:

a de-airing station for removal of air from the target medium;

a chromium adsorption column for removal of chromium from the target medium; and

a re-airing station for addition of air to the target medium after chromium has been removed from the target medium;

wherein the target medium is moved from the de-airing station to the chromium adsorption column to the re-airing station.

10. The system of claim 9 wherein the chromium adsorption column is composed of ferrous-form zeolite.

11. The system of claim 10 wherein the chromium adsorption column is a series of connected columns for housing the ferrous-form zeolite.

12. The system of claim 10 wherein the ferrous-form zeolite has approximately 0.5 to 2.0 meq ferrous iron/g.

13. Ferrous-form zeolite for the removal of chromium from an aqueous medium.

14. The ferrous-form zeolite of claim 13 wherein the ferrous is loaded from about 0.5 to about 2.0 meq ferrous iron/gram.